WHAT IS CLAIMED IS:

1. A non-aqueous electrolyte secondary battery comprising a positive electrode, a negative electrode, and a non-aqueous electrolyte, wherein

said positive electrode includes elemental sulfur, and said negative electrode includes silicon that stores lithium.

2. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said non-aqueous electrolyte includes a room temperature molten salt having a melting point of not higher than 60°C.

3. The non-aqueous electrolyte secondary battery according to Claim 2, wherein

said room temperature molten salt includes at least one type selected from the group consisting of trimethylpropylammonium bis(trifluoromethylsulfonyl)imide, trimethylhexylammonium bis(trifluoromethylsulfonyl)imide, and triethylmethylammonium 2,2,2-trifluoro-N-(trifluoromethylsulfonyl)acetamide.

4. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said non-aqueous electrolyte includes a quaternary

ammonium salt.

5. The non-aqueous electrolyte secondary battery according to Claim 4, wherein

said quaternary ammonium salt includes at least one type selected from the group consisting of trimethylpropylammonium bis(trifluoromethylsulfonyl)imide, trimethylhexylammonium bis(trifluoromethylsulfonyl)imide, and triethylmethylammonium 2,2,2-trifluoro-N-(trifluoromethylsulfonyl)acetamide.

6. The non-aqueous electrolyte secondary battery according to Claim 2, wherein

said non-aqueous electrolyte further includes at least one type of solvent selected from the group consisting of cyclic ether, chain ether, and fluorinated carbonate.

7. The non-aqueous electrolyte secondary battery according to Claim 6, wherein

said cyclic ether includes at least one type selected from the group consisting of 1,3-dioxolane and tetrahydrofuran; said chain ether preferably includes 1,2-dimethoxyethane; and said fluorinated carbonate includes at least one type selected from the group consisting of trifluoropropylene carbonate and tetrafluoropropylene

carbonate.

8. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said silicon is an amorphous silicon thin film or a microcrystalline silicon thin film.

9. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

a conductive agent is added to said positive electrode.

10. A non-aqueous electrolyte secondary battery comprising a positive electrode, a negative electrode, and a non-aqueous electrolyte, wherein

said negative electrode includes silicon that stores lithium, and

said non-aqueous electrolyte includes a room temperature molten salt having a melting point of not higher than 60°C and a reduction product of elemental sulfur.

11. The non-aqueous electrolyte secondary battery according to Claim 10, wherein

said positive electrode includes elemental sulfur.

12. The non-aqueous electrolyte secondary battery

according to Claim 10, wherein

said reduction product of elemental sulfur is obtained by reducing elemental sulfur in a room temperature molten salt having a melting point of not higher than 60°C and an organic electrolyte.

13. The non-aqueous electrolyte secondary battery according to Claim 10, wherein

said silicon is an amorphous silicon thin film or a microcrystalline silicon thin film.

14. The non-aqueous electrolyte secondary battery according to Claim 10, wherein

said room temperature molten salt includes at least one type selected from the group consisting of trimethylpropylammonium bis(trifluoromethylsulfonyl)imide, trimethylhexylammonium bis(trifluoromethylsulfonyl)imide, and triethylmethylammonium 2,2,2-trifluoro-N-(trifluoromethylsulfonyl)acetamide.

15. The non-aqueous electrolyte secondary battery according to Claim 10, wherein

a conductive agent is added to said positive electrode.

16. A method of manufacturing a positive electrode

comprising the step of processing an electrode including elemental sulfur under reduced-pressure with the electrode immersed in a non-aqueous electrolyte, thereby impregnating the electrode with the non-aqueous electrolyte.

17. The method of manufacturing a positive electrode according to Claim 16, wherein

a pressure during said reduced-pressure process is set to not higher than 28000 Pa.

18. A positive electrode comprising an electrode impregnated with a non-aqueous electrolyte obtained by processing an electrode including elemental sulfur under reduced-pressure with the electrode immersed in a non-aqueous electrolyte.

19. A method of manufacturing a non-aqueous electrolyte secondary battery including the step of preparing a positive electrode by processing an electrode including elemental sulfur under reduced-pressure with the electrode immersed in a non-aqueous electrolyte.

20. A non-aqueous electrolyte secondary battery comprising:

a positive electrode impregnated with a non-aqueous

electrolyte obtained by processing an electrode including elemental sulfur under reduced-pressure with the electrode immersed in a non-aqueous electrolyte;

a negative electrode; and

a non-aqueous electrode including a room temperature molten salt having a melting point of not higher than 60°C.

21. The non-aqueous electrolyte secondary battery according to Claim 20, wherein

said room temperature molten salt includes a quaternary ammonium salt.

22. The non-aqueous electrolyte secondary battery according to Claim 21, wherein

said quaternary ammonium salt includes at least one type selected from the group consisting of trimethylpropylammonium bis(trifluoromethylsulfonyl)imide, trimethylhexylammonium bis(trifluoromethylsulfonyl)imide, and triethylmethylammonium 2,2,2-trifluoro-N-(trifluoromethylsulfonyl)acetamide.

23. The non-aqueous electrolyte secondary battery according to Claim 20, wherein

said non-aqueous electrolyte includes at least one type of solvent selected from the group consisting of cyclic ether,

chain ether, and fluorinated carbonate.

24. The non-aqueous electrolyte secondary battery according to Claim 23, wherein

said cyclic ether includes at least one type selected from the group consisting of 1,3-dioxolane and tetrahydrofuran; said chain ether includes 1,2-dimethoxyethane; and said fluorinated carbonate includes at least one type selected from the group consisting of trifluoropropylene carbonate and tetrafluoropropylene carbonate.

25. The non-aqueous electrolyte secondary battery according to Claim 20, wherein

a conductive agent is added to said positive electrode.

26. The non-aqueous electrolyte secondary battery according to Claim 20, wherein

said negative electrode includes a carbon material or a silicon material.